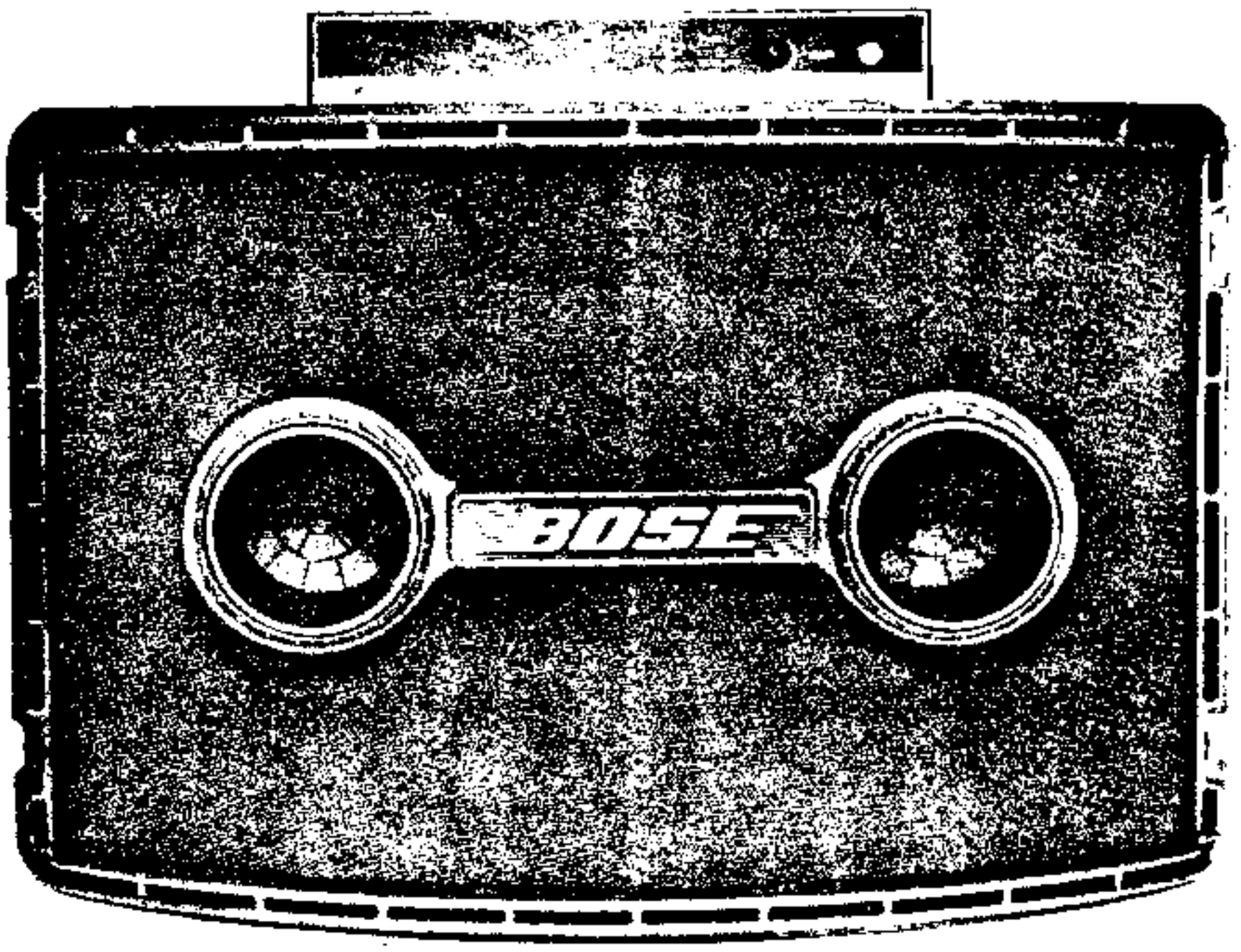
BOSE® 802 Professional Loudspeaker System

Met dank aan A.R.A. van Rossum



SPECIFICATIONS

GENERAL

The BOSE 802 Professional Loudspeaker System consists of two speaker enclosures (cabinets) and a separate Active Equalizer. Each cabinet contains eight identical high-efficiency, full-range drivers. The drivers each have an impedance of one ohm and are wired in series to give a system impedance of eight ohms. The cabinet also includes an Impedance Control Capacitor which controls the system impedance at high frequencies, reducing the amplifier power requirements of the system.

Each driver has a molded, high-impact polymer frame that reduces flux leakage to maintain high efficiency. The driver voice coils are made of flat aluminum ribbon, edge-wound on an aluminum bobbin for high efficiency and high power handling ability. Each driver has a 12-ounce ceramic magnet for high efficiency and resistance to demagnetization.

Each enclosure incorporates two Reactive Air Columns that function to reduce driver cone excursion at very low frequencies. This allows the 802 to produce high output levels at deep bass frequencies with a minimum of distortion.

The cabinet is composed of mica-filled, high-density polyethylene structural foam. This reinforced polymer material combines light weight, high strength, and impact resistance for ruggedness in transportation.

The 802-E Equalizer adjusts the spectrum of the audio signal, permitting the 802 system to provide broad, flat frequency response without using woofers, horns, or crossover networks that cause audible coloration. The Equalizer must be used with the system to achieve satisfactory performance.

EQUALIZER

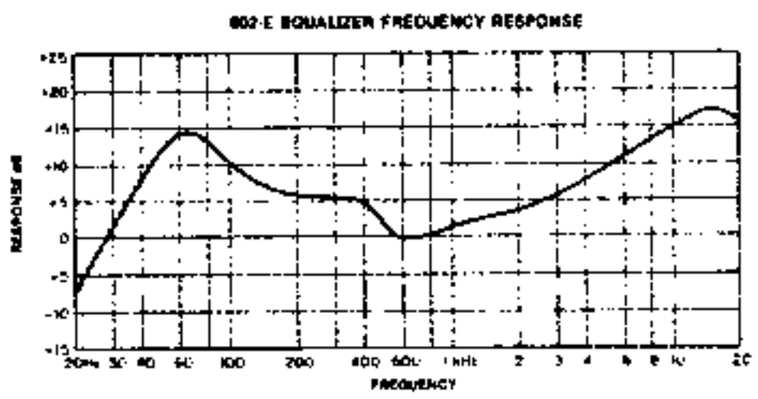
Dimensions:
25.4 cm (10″) W x 12.7 cm (5″) D
x 4.8 cm (1-7/8″) H

Weight:
.738 Kg (1.6 lbs.)

Input Impedance:
4 K ohms (balanced inputs),
50 K ohms (unbalanced inputs)

Output Level:
5 volts into 2 K ohms or higher,
3.5 volts into 600 ohms.

Gain:
(See Frequency Response Graph)



Power Requirement:
3.5 Watts, 110 V AC or
220 V AC (not available in U.S.A.)

SPEAKER SYSTEM

Dimensions:
41 cm (16-1/8″) x 51 cm (20-1/4″)
x 34 cm (13-1/4″) with cover

Weight:
16 Kg (36 lbs.)

Driver Complement:
8 114 mm (4½″) full-range drivers

Impedance:
8 ohms

Magnet Weight:
2.7 Kg (96 ounces) total

Power Handling:
160 Watts continuous

Amplifier Power:
300 Watts maximum

$1.00

Service Manual

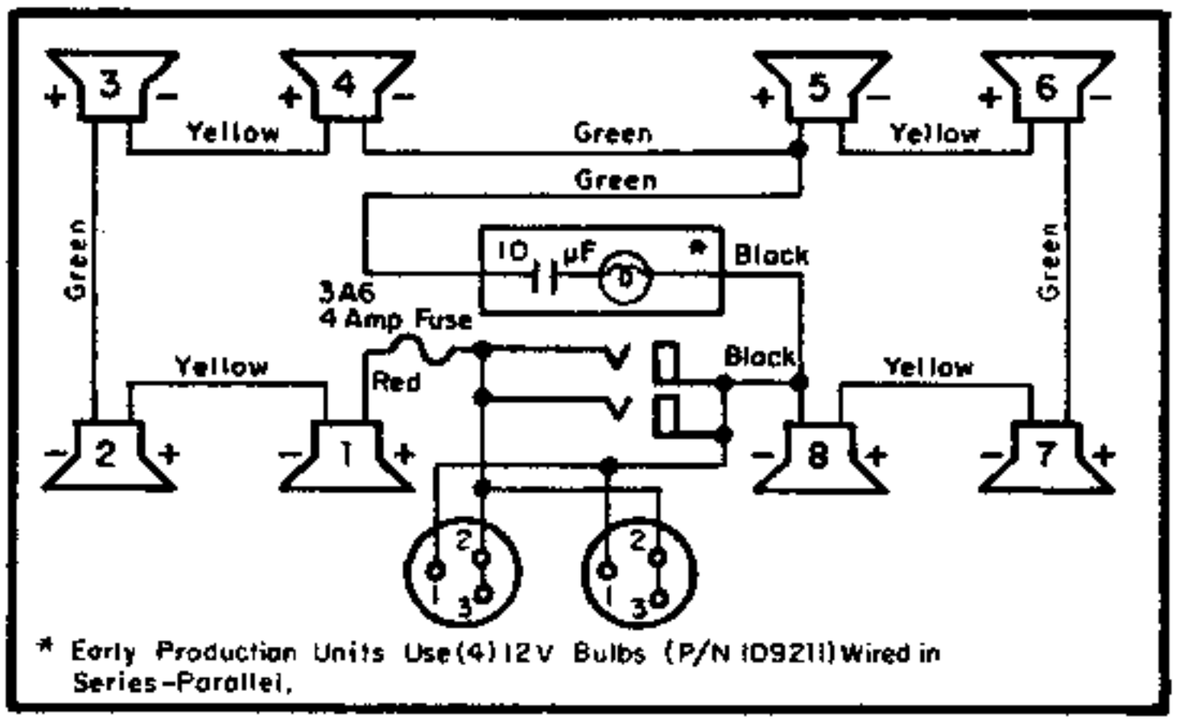


Figure 1 SPEAKER SCHEMATIC

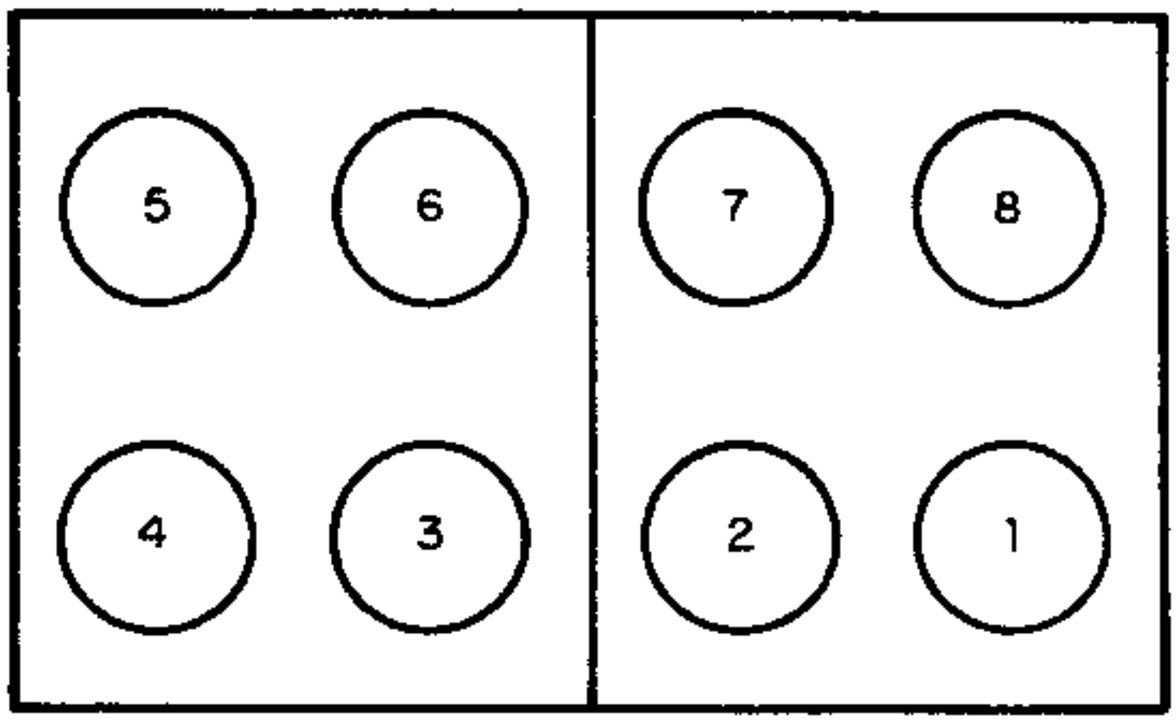


Figure 2 DRIVER PLACEMENT (FRONT VIEW)

I. DISASSEMBLY PROCEDURE

1. **GRILLE** — Remove the two **clinch nuts** and **grille retainer** holding the grille in place. Lift the grille by pulling from the hole in the grille's center. Carefully remove the grille and place in a safe location until needed for reassembly.

2. **BACK PANEL** — Remove drivers two (2) and three (3) to obtain access to the internal rear panel connections. This will provide access for repairs associated with the internal connections of the back panel.

3. **IMPEDANCE CONTROL NETWORK** — Remove drivers two (2) and three (3) to obtain access to the impedance control assembly. This will allow a continuity check of the bulb circuit and a check of the wiring and impedance control capacitor.

II. TEST PROCEDURE

1. **CONTINUITY CHECK** — An open driver may be detected by using an ohmmeter and checking continuity. Insert a phone jack in the rear of the speaker and check continuity by carefully penetrating the black cement covering the flexible conductor on the surface of each cone with an ohmmeter lead. Check continuity between each driver and the speaker terminals until the open driver is detected. See Figures 1 and 2.

2. **POWER CHECK** — Using a 50-watt (20 volt) sine wave signal, sweep the range between 40 and 200 Hz. Check for rattles, buzzing or voice coil rubbing. Reduce the output to 5 watts (6.5 volts), and continue to sweep the range between 200 and 16,000 Hz. Note: When using a sine wave signal on the 802 Speaker System, do not operate the speaker below 80 Hz at levels greater than 20 watts (12.6 volts) as possible damage to the drivers may occur.

3. **PHASING CHECK** — Using a 6- to 20-volt battery or DC power supply, check that all speakers are in phase (moving together). Connect the positive portion of the power supply to the "tip" terminal of the phone jack and the ground connection of the power supply to the "sleeve" terminal of the phone jack. This will produce an outward motion of all drivers. See Figure 1.

4. **IMPEDANCE CONTROL NETWORK** — Check the bulb circuitry and wiring of the impedance control circuitry by using an 8 kHz sine wave signal at 2V RMS ±1%.
Insert a 0.5 ohm ±1% resistor in series with the ground lead for the speaker. A voltage drop of 60-77 mV RMS should be measured across the resistor. If incorrect, check the bulb(s) and capacitor.

III. SERVICE NOTES

1. When replacing 802 drivers, be certain to use the 802 driver gasket (Part number 110943) to properly seal the driver to the 802 cabinet.

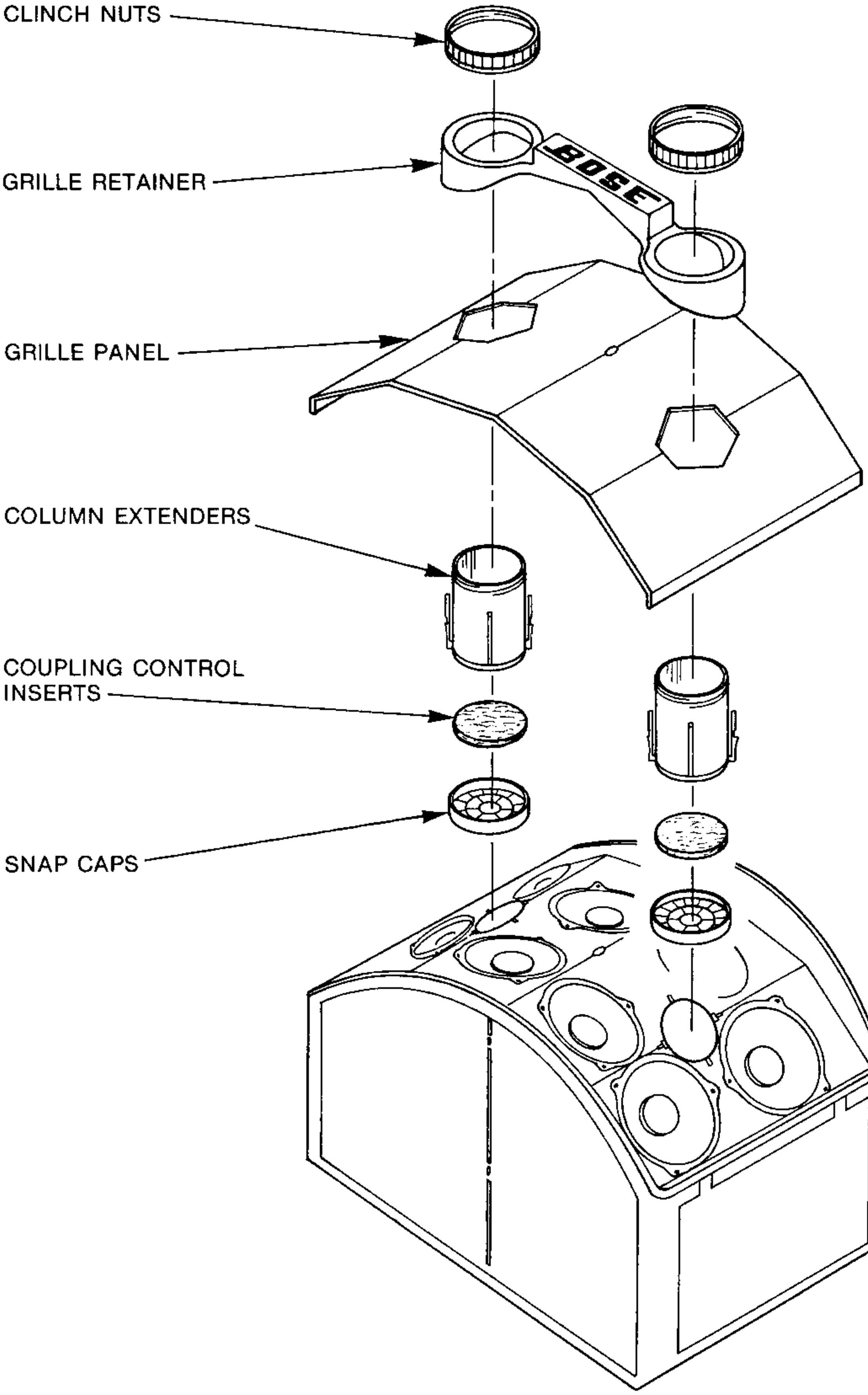
2. Check the **coupling control inserts** for dirt or dust. If they are clogged, replace them with the spares provided in the top cover of the 802 speaker. Extra **coupling control inserts** may be obtained through the BOSE Customer Service Department or your BOSE Professional Products Dealer. One of the unusual features of the 802 is the use of the **coupling control inserts.** These are polyester "fuzz" discs which are installed in the Reactive Air Columns. Their purpose is to decouple the drivers from one another near the resonant frequency of the system.

   After prolonged use, these inserts and their gauze covers may become plugged with dirt or dust, causing them to lose their effectiveness. This results in a "buzzing" sound during heavy bass passages.

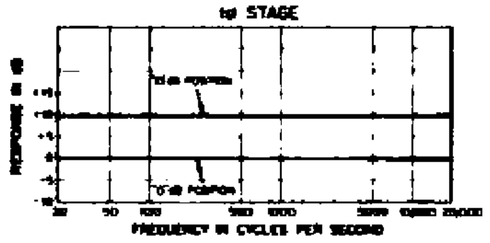
   The inserts may be easily removed for inspection or replacement (two spare sets of inserts are supplied with the 802): (See Figure 3):

   a. Remove the two **clinch nuts** by rotating them counter-clockwise.
   b. Remove the **grille retainer** and the **grille.**
   c. Remove the two **column extenders** by pinching both release tabs and pulling gently. Do not use sharp tools as they could damage the thin seal lip.
   d. Remove the **snap caps** from the **column extenders** by prying them off gently with your fingernails.
   e. Examine the **coupling control inserts** for dirt or dust. If they are clogged, replace them with the spares provided.
   f. Wash the gauze-covered ends of the **column extenders** by swishing them around in warm, soapy water. Rinse in clear water and allow them to air-dry thoroughly.
   g. Reassemble the system by reversing the above procedure, pushing the **column extenders** in firmly until they snap into place. Be certain to center the **grille retainer** before tightening the **clinch nuts.** Tighten the **clinch nuts** ***firmly but not excessively.***
   h. Extra **coupling control inserts** may be obtained through the BOSE Customer Service Department or your BOSE Professional Products Dealer.

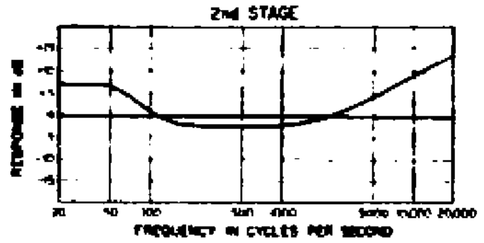
   This is the only periodic maintenance required by the 802 system.


CLINCH NUTS
GRILLE RETAINER
GRILLE PANEL
COLUMN EXTENDERS
COUPLING CONTROL INSERTS
SNAP CAPS
BOSE

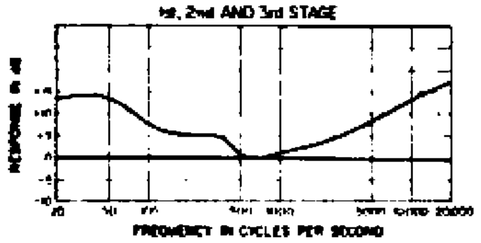
DIFFERENTIAL INPUT and
0 or 10 dB GAIN SWITCHING
1st STAGE



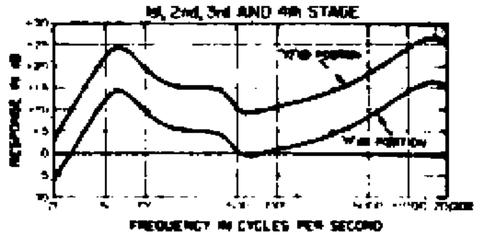
FREQUENCY SHAPING
2nd STAGE



FREQUENCY SHAPING
1st, 2nd AND 3rd STAGE



FREQUENCY SHAPING
1st, 2nd, 3rd AND 4th STAGE



INPUT CHANNEL 1

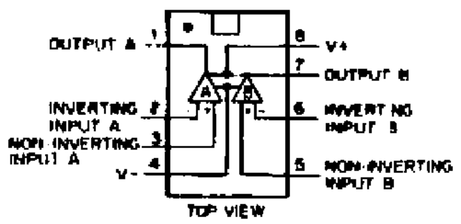
INPUT CHANNEL 2

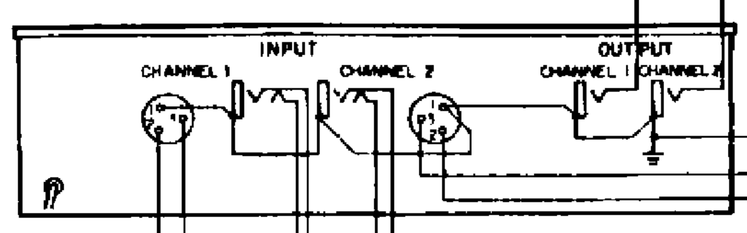
OUTPUT CHANNEL 1

OUTPUT CHANNEL 2

AC INPUT

LED INDICATOR





NOTES:

1. UNLESS OTHERWISE SPECIFIED
   RESISTORS IN Ω, 1/4W, 5%
   CAPACITORS IN μF
2. ALL IC's ARE LF 353 OR TL072 OR 4558
3. DC VOLTAGES ARE FOUND ON CHANNEL 2 OF THE SCHEMATIC
4. VOLTAGE CONVERSION INFORMATION
   120 - 240 VAC
   THE BOSE 802 EQUALIZER MANUFACTURED FOR 120VAC OPERATION IS NOT CONVERTIBLE TO 240VAC OPERATION EXCEPT BY FACTORY MODIFICATION. CONTACT THE FACTORY FOR SERVICE INSTRUCTIONS.
   240 - 120VAC
   THE BOSE 802 EQUALIZER MANUFACTURED FOR 240VAC OPERATION IS CONVERTIBLE TO 120VAC OPERATION BY CHANGING THE WIRING TO THE POWER TRANSFORMER PRIMARY.
   a. REMOVE POWER TRANSFORMER LINK LK-2
   b. ADD POWER TRANSFORMER LINK LK-1 AND LK-3 (THE SPEAKERS RF NO VOLTAGE CONVERSION)
   c. CUT THE EXISTING 240 FROM THE UNIT AND REPLACE WI / TYPE
   d. REMOVE 240 VAC STICKER FROM REAR OF UNIT
5. TEST PROCEDURE
   0dB IS REFERENCED TO AN EQUALIZER INPUT VOLTAGE OF 200mV USING A 630Hz SINE WAVE. DO NOT USE TEST SIGNALS HIGHER THAN 400mV AS POSSIBLE OVERLOAD (DEPENDING ON FREQUENCY) CAN OCCUR. MAXIMUM OUTPUT VOLTAGE (5.5 VOLTS INTO 600 OHMS OR 5.0 VOLTS INTO 2 KOHM OR HIGHER) OCCURS AT 60 Hz AND 16 kHz.
6. RESPONSE CHARACTERISTICS FOR EACH TEST POINT IS SHOWN ABOVE (EQUALIZER GAIN SWITCH SET IN 0dB GAIN POSITION EXCEPT FOR FIRST AND LAST GRAPH)
7. EQUALIZER GAIN SWITCH SET IN 0dB GAIN POSITION FOR ALL UNITS
*8. EARLY 802 EQUALIZERS
   HAVE THE POTENTIAL OF OSCILLATION UNDER LOW LINE CONDITIONS (THE OSCILLATION IS GENERALLY DESCRIBED AS A HIGH-PITCHED WHISTLE OR DISTORTION). TO CORRECT THIS PROBLEM
   CHANGE R1,2 FROM 300Ω TO 100Ω
   CHANGE R3 FROM 5.3 kΩ TO 10 kΩ

PARTS LIST

802 EQUALIZER

SYMBOL	DESCRIPTION	PART NUMBER
	Resistors	
R1, 2	.25W 100 OHMS ± 5%	107170-101
R3	.25W 10K OHMS ± 5%	107170-103
R128, 328	.50W 510 OHMS ± 5%	102942-511
R121, 321	.25W 1K OHMS ± 5%	107170-102
R120, 320	.25W 1.2K OHMS ± 5%	107170-122
B113, 313	.25W 470 OHMS ± 5%	107170-471
R124, 125, 324, 325	.25W 18K OHMS ± 5%	107170-183
R122, 126, 322, 326	.25W 22K OHMS ± 5%	107170-223
R118, 119, 318, 319	.25W 27K OHMS ± 5%	107170-273
R112, 312	.25W 5.6K OHMS ± 5%	107170-562
R114, 314	.25W 10K OHMS ± 5%	107170-103
R123, 323	.25W 160K OHMS ± 5%	107170-164
R111, 311	.25W 24K OHMS ± 5%	107170-243
R101, 103, 301, 303	.25W 1M OHMS ± 5%	102939-105
R107, 307	.25W 681 OHMS ± 1%	104095-6810
R108, 308	.25W 1.24K OHMS ± 1%	104095-1241
R110, 310	.25W 1.82K OHMS ± 1%	104095-1821
R109, 309	.25W 3.92K OHMS ± 1%	104095-3921
R104, 105, 127, 137, 304, 305	.25W 2.00K OHMS ± 1%	104095-2001
R106, 306	.25W 51.1K OHMS ± 1%	104095-5112
R115, 315	.25W 75K OHMS ± 5%	107170-753
	Capacitors	
C1	CER DISC .0047 μF 1.4KV	103447
C2	CER DISC .01 μF 100V	103730
C3, 4	ELCTLC 470/500 μF 25V	110704
C112, 117, 312, 317	Film .0012 μF 100V ± 5%	110913-122
C118, 319	CER DISC 270 pF 100V ± 5%	106767-271
C106, 107, 108, 306, 307, 308	Film 0.15 μF 100V ± 5%	106510-154
C110, 310	Film .0033 μF 100V ± 5%	106510-332
C111, 115, 116, 311, 315, 316	Film .047 μF 100V ± 5%	106510-473
C101, 102, 119, 301, 302, 319	ELCTLC 25 μF 25V	104560
C103, 104, 113, 114, 303, 304, 313, 314	CER DISC 0.1 μF 100V	106881

SYMBOL	DESCRIPTION	PART NUMBER
	Miscellaneous	
	Chassis	109254
	Cover	109255
	Line Cord 115/100V	111672
	Line Cord 220V	109631
	Strain Relief	106346
T1	Transformer (220V)	108331
T1	Transformer (115V)	110385
T1	Transformer (100V)	111060
S1	Power Switch DPDT	108425-5
S2	Slide Switch DPDT	110695
	Socket I.C. 8 Pin	107147-8
	Phone Jack Input	104877
	Phone Jack Output	102626
	XLR Connector	106894
	Pushbutton	106677-3
	Panel Mount LED Ass'y	111558
	Semiconductors	
Z1	Bridge Rectifier	110696
D1	Zener Diode 24V 1W	110697
U101, 301, 102, 302	I.C. OP AMP (SIM to LF353 or TL027)	111223-02

802 LOUDSPEAKER

Column Extender	109358
Snap Cap	111556
Grille Retainer	109355
Coupling Control Insert	109466
Grille	109467-18
Driver Assembly	109464-5
Gasket, Speaker	111624
Coupling Control Inserts Kit	111244
Thumbscrew, M8	108989
Literature Kit	109463
Fuse, 3 AG, 4 amp (120V)	104715-400
Fuse 5 x 20 mm 4 amp (International)	109494-400
Fuse Cap (120V)	109484
Fuse Cap (Universal)	109493
Capacitor 10 μF 10% 75 VDC	110311
Lamp 12V (4)	109211
Lamp 24V (1)	111431
Phone Jack	102640
XLR Connector	109486
Fuseholder Body	109485
Tinnerman Clip	109481
Audio Cables	102643
Frequency Contouring Assy.	111361
Accessory Kit	110707
Carton Kit	109459
Pinch Clinch	109356
Latch	109480
Thumbscrew Clips	109483

BOSE
THE MOUNTAIN, FRAMINGHAM, MASS. 01701

Printed in U.S.A. 111233

BOSE PRODUCT SERVICE BULLETIN

Product 802 AND 901 IV EQUALIZERS # EQ-83-02

Subject EQUALIZER IC's

Effective Date January 3, 1983

S/N N/A

Failure tracking has shown that a higher than average incidence of failures in equalizers has been due to a parts problem. Early production runs of the 802 and 901 Series IV equalizers used National LF 353 op-amps. It has been shown that some of these components have lead contamination problems and are prone to failure. Typically, they exhibit high noise, although many will fail completely.

National has since modified their processes so that this failure mode is no longer prevalent. Additionally, we have changed vendors to Motorola TLO 72 or Raytheon 4558 and 4559.

It is suggested that for all equalizer failures that are using the LF 353 IC, that all four IC's be changed for the Motorola or Raytheon IC's mentioned above. This should reduce the likelyhood of additional future failures in the cutsomer's unit.

BOSE PRODUCT INFORMATION BULLETIN

Product 802 Speakers # Pro-80-001

Subject TROUBLESHOOTING GUIDE

Effective Date April 29, 1980

S/N N/A

The series-wired drivers and the Impeadance Control circuit (capacitor) in the BOSE Model 802 speaker can cause some peculiar symptoms if a failure occurs. The following guide should be of some help to you in troubleshooting the 802 speakers.

SYMPTOM	DEFECT
1. No Sound	Open driver in bottom row.
2. No Bass	Open driver in top row.
3. Low output (only 4 dirvers working)	Shorted capacitor.
4. Intermittent "zapping" sound	Intermittent capacitor.